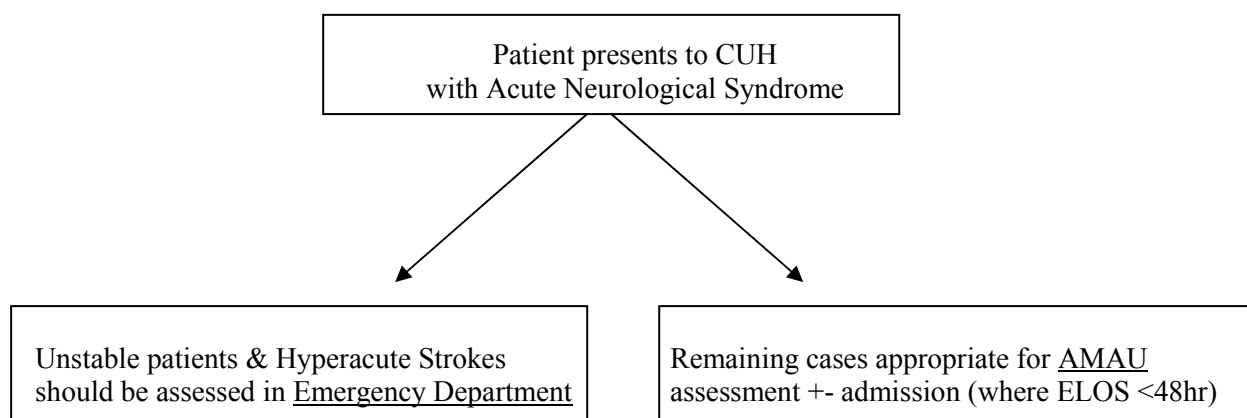


CUH Department of Neurology Admissions & AMAU Policy Jan 2011



The role of the Neurology service in the AMAU

The Neurology service endeavours to provide a rapid service for both direct admissions under the service as well as consultations, as follows:

- (i) Direct admissions under service during daytime will be seen on the same day
- (ii) Overnight direct admissions under the Neurology service will be seen on the following morning before 10am
- (iii) AMAU consultations will be seen on the day of request. Please submit written consult requests to 2A before 11am and call the registrar on-call for consults in person.

Cases appropriate for direct admission under Neurology service:

- (i) Any patient where primary reason for admission is clearly neurological in nature, irrespective of co-morbidities
- (ii) Patients with acute stroke or history convincing for TIA age 64 or younger
- (iii) Meningismus with abnormal CSF analysis
- (iv) First or untreated seizures (in the absence of alcohol or illicit drug use)

Cases appropriate for Neurology consultation rather than direct admission:

- (i) Patients where primary reason for admission is not neurological in origin, irrespective of prior or concurrent Neurological illness
- (ii) 'Neurology patients' (i.e. patients that already attend or have attended the Neurology outpatient clinic) who present with a non-neurological problem, particularly sepsis
- (iii) Seizures in the setting of alcohol or drug abuse
- (iv) Meningismus with normal CSF analysis
- (v) Acute Headaches
- (vi) Syncope
- (vii) Back pain

This policy serves as a guideline. The Neurologist on-call is available by phone to discuss cases.

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January 2011

AMAU initial management recommendations for NCHDs for common neurological presentations

1st seizure with full recovery

- IV line
- Chart PRN lorazepam 2mg in event of further seizures
- Basic lab studies including CPK
- Check ECG including QTc & PR intervals
- Epilepsy protocol MRI Brain study (with T2 and FLAIR axial & coronal sequences)
- EEG
- CT Brain study not needed unless focal neurological signs evident

Seizures in patient with pre-existing Epilepsy, with full recovery

- IV line
- Chart PRN lorazepam 2mg in event of further seizures
- Basic lab studies
- Check AED levels (Carbamazepine, Valproate, Phenytoin, Phenobarbital)
- Check ECG including QTc & PR intervals

Alcohol- or illicit drug-associated seizures

- CT Brain if recent history of head injury or external signs of head trauma or not waking up
- High dose IV Thiamine (Pabrinex vials I+II 2 pairs tid) if at significant risk of Wernicke encephalopathy
- Basic lab studies including CPK
- Check AED levels (Carbamazepine, Valproate, Phenytoin, Phenobarbital)
- IV line
- Chart PRN lorazepam 2mg in event of further seizures
- Check ECG including QTc & PR intervals
- Alcohol Liaison Service consultation
- Medical Social Work referral
- Neurology consultation

Acute Headaches

- Consider following diagnostic possibilities- subarachnoid haemorrhage, raised intracranial pressure, paranasal sinusitis, temporal arteritis, subdural haematoma, pituitary apoplexy, meningitis, encephalitis
- Check routine labs including ESR and C-reactive protein
- CT Brain without contrast if no prior history of headaches
- CSF analysis: NB- don't forget to measure opening pressure and assess for xanthochromia
- For Acute Migraine Therapy consider the following (alone or together):
 - Naproxen 500mg, then 250mg tid
 - Solpadol 30/500 1-2 tablets every 4-6 hours (up to 8/day)
 - Metoclopramide 10mg tid PO or IV for nausea
 - Lorazepam 0.25-0.5mg bid-tid
- Neurology consultation if headache atypical, persistent or not responding to treatment

Acute Ischaemic Stroke not suitable for Thrombolysis

- Discuss case with on-call Neurologist if patient gives history of recent recurrent TIAs
- Non-contrast Head CT
- Aspirin 300mg per day (unless infarct large- discuss with Neurologist)
- Fasting lipids & glucose
- TEDS + Innohep 3500 IU/day
- Basic lab studies (FBC, ESR, PT-APTT, glucose, Renal & Liver panels)
- ECG
- Cardiac Telemetry if available
- Chest X-ray
- Toxicology screen (if appropriate)

Focal sensory or motor symptoms unlikely to be a hyperacute stroke

- Neurology consultation
- MRI Brain (Stroke protocol or Demyelination protocol depending on situation)
- Consider MRA Neck

Acute Intra-cerebral Haemorrhage (excluding Subarachnoid Haemorrhage)

- Vital signs
- TEDS
- Hold all anti-thrombotic and anti-coagulant therapies
- Basic lab studies (FBC, ESR, PT-APTT, glucose, Renal & Liver panels)
- Non-contrast Head CT
- Alert on-call Neurologist and Neurosurgical service if haemorrhage large, extends into ventricle(s) or within cerebellum
- Treat source of fever and treat fever itself
- Treat hyperglycaemia
- Measure volume of haemorrhage by 'ABC/2' method, where A is the greatest haemorrhage diameter by CT, B is the diameter 90 degrees to A and C is the approximate number of CT slices with haemorrhage multiplied by slice thickness in cm
- Consider repeating non-contrast Head CT scan 12 hours after 1st CT study or in event of neurological deterioration
- Elevated blood pressure management (systolic consistently >200mmHg) (suggested medications in approximate order of preference)
 - Labetalol: 5-100mg/hr by intermittent bolus doses of 10-40mg or infusion (2-8mg/min)
 - Nicardipine: 5mg/hr increased by 2.5 mg/hr q15 minutes to max 15 mg/hr.
 - Esmolol: 250mcg/kg as a load; maintenance use, 25-300 mcg/kg/min
 - Enalapril: 0.625-5mg IV qid
 - Hydralazine: 5-20mg IV q30min
 - Nitroprusside: 0.1-10 mcg/kg/min

- Patient on Warfarin:
 - (i) check INR & stop warfarin
 - (ii) give prothrombin complex concentrate (Octaplex®) as follows:

INR	Recommended dose of Octaplex
INR 2.0 – 3.9	25iu/kg
INR 4.0 – 6.0	35iu/kg
INR > 6	50iu/kg

- (iii) give Vitamin K 5 mg IV over 5 minutes. Intravenous vitamin K is associated with a small risk of severe allergic reaction. When administered intravenously, the rate should not exceed 1mg/minute. Usually 5mgs of Vitamin K will completely reverse anticoagulation. If the INR is greater than 1.3 at 4 hours, administer 2nd dose of Vitamin K 10 mg IV. When partial correction is required (e.g. prosthetic heart valve) to achieve a target therapeutic INR, IV Vitamin K can be administered in low doses of 1-2mgs sublingually
- (iv) give Fresh Frozen Plasma if Octaplex unavailable
- (v) recheck INR

- Patient on Aspirin in addition to warfarin can be considered for platelet transfusion.
- Patient on unfractionated heparin- calculate total amount of heparin received over the preceding 3 hours. Give protamine by slow IV injection, not to exceed 5mg/min, with total dose not to exceed 50mg (monitor for signs of anaphylaxis), as follows:
 - If initiated <30 minutes of last heparin dose: Give 1mg protamine per 100U heparin
 - If initiated within 30-60 minutes: Give 0.5-0.75 mg protamine per 100U heparin
 - If initiated within 60-120 minutes: Give 0.375-0.5mg protamine per 100U heparin.
 - If heparin stopped >120 min ago: Give 0.25-0.375mg protamine per 100U heparin
- Patient on Enoxaparin: 1mg protamine for each mg of enoxaparin; if PTT prolonged 2-4 hours after first dose, consider additional dose of 0.5 mg for each mg of enoxaparin
- Patient on Dalteparin or tinzaparin: 1mg protamine for each 100 anti-Xa IU of dalteparin or tinzaparin; if PTT prolonged 2-4 hours after first dose, consider additional dose of 0.5 mg for each 100 anti-Xa IU of dalteparin or tinzaparin
- Patient on Direct Thrombin Inhibitors (Argatroban, Lepirudin, Bivalirudin, Ximelagatran): there is no specific antidote for these drugs at this time.

Respiratory symptoms in established Neuromuscular disorders

- Inform treating Neurologist
- CXR
- Check respiratory status- ABGs (room air), FVC, maximal inspiratory & expiratory pressure by mouth (MIP and MEP), maximal nasal sniff inspiratory pressure (SNIP), SaO₂ monitoring
- Consider non-invasive ventilation (after discussion with treating physicians)
 - Symptoms of respiratory dysfunction
 - FVC <50% predicted or SNP <40cm H₂O
 - Nocturnal oxygen desaturation of 90% for at least one cumulative minute
 - Arterial blood gases: elevated pCO₂

Vertiginous dizziness

- Consider Vestibular sedative: betahistone (Serc) 8-16mg tid, prochlorperazine (Stemetil) PO or IM, lorazepam (ativan) 0.25mg- 0.5mg bid- tid
- Consider Neurology consultation if symptoms persistent or atypical

Unwitnessed collapse & Syncope

- Check ECG including QTc & PR intervals
- Consider Short Synacthen test, Echocardiogram, Cardiac Telemetry, EEG
- Neurology & Cardiology consultations as deemed appropriate by AMAU team

Delirium & Encephalopathy

- Assess for pain, faecal impaction (DRE & PFA), urinary retention (bladder scan), medication toxicity
- Routine labs- consider arterial ammonia, toxicology screen
- Sepsis screen
- Consider EEG if non-convulsive status epilepticus possible

Acute-onset Gait difficulties

- Urgent Neurology +/- Neurosurgical assessments if clinical deterioration rapid
- MRI Whole Spine if patient reports significant back pain

Syncope

- Check ECG including QTc and PR intervals & erect & supine BP
- Consider early AM cortisol +/- synacthen test, cardiac telemetry, TTE, Tilt table test
- Neurology & Cardiology consultations as deemed appropriate by AMUA team

Acute visual disturbance

- Urgent Neurology assessment if clinical deterioration rapid
- Check corrected visual acuity
- Ophthalmology assessment

Progressive lower limb weakness

- Urgent Neurology assessment if clinical deterioration rapid
- MRI Whole Spine, particularly if patient reports significant back pain
- CSF analysis (cell counts, protein, glucose)
- Assess respiratory status (see below)
- Assess bladder function (post-void bladder scan)